

METROPOLITAN STATE COLLEGE *of* DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Letters, Arts and Sciences

Department: Chemistry

CIP Code: 40.0502

Prefix & Course Number: CHE 3700

Crosslisted With*: _____

Course Title: Criminalistics I

Check All That Apply: Required for Major: _____ Required for Minor: _____ Specified

Elective: _____

Required for Concentration: Elective: _____ Service Course: _____

Credit Hours: 4 (3+3)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 45 Lab 45 Internship _____ Practicum _____ Other (please specify type and hours):

Schedule Type(s): B Grading Mode(s): L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): None

Prerequisite(s): CHE 2710, CHE 3000, CHE 3010, CHE 3110, CHE 3130

Corequisite(s): None

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s):

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This course introduces the theory and practice of forensic science with an emphasis on the analysis and interpretation of physical evidence. Class and laboratory introduce forensic microscopy, crime scene investigation, trace evidence search, forensic chemistry, toxicology, drug analysis and fire debris analysis.

APPROVED:

Department Chair OR Program Director

Date
2/14/07

Dean OR Associate Dean

Date
2/20/07

Associate VP, Academic Affairs

Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

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Required Reading and Other Materials will be equivalent to:

Forensic Chemistry, Bell, S., Pearson/Prentice Hall 2006.

Forensic Science Handbook, Vol. II., 2nd Edition, Saferstein, R., Pearson/Prentice Hall 2005.

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. describe the role of the criminalist in the criminal justice system.
2. discuss the responsibilities of the criminalist/forensic scientist at a crime scene and in the laboratory .
3. discuss the role of bias in Criminalistics and methods of protecting against it.
4. discuss the components of ethics as applied to the criminalist.
5. discuss the legal aspects of physical evidence analysis including search and seizure, chain of custody and admissibility.
6. describe the components of a microscope and their functions.
7. describe numerical aperture, magnification, empty magnification and the general lens equation.
8. prepare a properly documented research paper based upon primary literature sources.
9. present a 20 minute oral report.
10. describe a scheme for screening and confirming controlled substances in seized drug evidence.
11. describe the use of gas chromatography to quantitatively analyze blood for the presence of ethanol.
12. discuss the pharmacology and pharmacokinetics of ethanol.
13. use fourier transform infrared spectrometry to identify controlled substances.
14. use Pyrolysis Gas Chromatography to compare paint chips.
15. use Gas Chromatography-Mass spectrometry to identify drugs in body fluid or seized drug exhibits
16. use color and microcrystalline tests to screen seized drug exhibits.
17. use Gas Chromatograph (GC) or Gas Chromatograph-Mass Spectrometer (GC-MS) to examine fire residues.
18. use polarized light microscopy to characterize and compare fibers.
19. discuss the attributes of acceptable courtroom testimony.
20. describe the theory and application of Mass Spectrometer, Gas Chromatograph , Ultraviolet/Visible Spectrophotometer , Infrared Spectrophotometer, electron microscopy, and pyrolysis gas chromatography in forensic science.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):

- I. Introduction to Criminalistics
 - A. Role of the criminalist
 - B. Physical evidence recognition, collection, preservation
 - C. Ethics
 - D. Applying the scientific method
- II. Collection of trace evidence in the laboratory
 - A. Search of clothing
 - B. Packaging of evidence
 - C. Report writing
- III. Drug analysis
 - A. Drug law
 - B. Presumptive testing
 - C. Confirmation testing
 - D. Laboratory experience
- IV. Analytical Toxicology
 - A. Ethanol and related compounds
 - B. Carbon monoxide and cyanide
 - C. Heavy metals
 - D. Drugs
 - E. Others

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- V. Fire debris analysis
 - A. Extraction of sample
 - B. Chromatography/mass spectrometry
 - C. Data interpretation
 - D. Laboratory experience
- VI. Paint analysis
 - A. Chemistry of paint
 - B. Comparison of paint
 - C. Laboratory experience
- VII. Explosives and gunshot residue analysis
- VIII. Fiber analysis
 - A. Chemistry and manufacture
 - B. Polarized light microscopy
 - C. Laboratory experience
- IX. Report writing
- X. Oral presentation

Evaluation of Student Performance

The final grade determination will be based on the student's performance in :

1. one or more 75 minute midterm examinations,
2. a 120 minute final examination,
3. at least one research paper,
4. one oral presentation, and
5. several laboratory projects.
6. Quizzes may also be included.